FORM PTO-1390 (REV. 11-2000) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER: 01-9198

U.S. APPLICATION NO. (If known, see 37 CFR 1.5): C 10/048199

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/EP00/07249	27 July 2000 (27.07.00)	27 July 1999 (27.07.99)

TITLE OF INVENTION: SAFETY SYRINGE

APPLICANT(S) FOR DO/EO/US: BANG, Young Chul
MEDI plus TEC Medizinisch-technische Handelsgesellschaft mbH

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☐ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND or SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☐ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. ☒ is attached hereto (required only if not communicated by the International Bureau).
   b. ☐ has been communicated by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
   a. ☐ is attached hereto.
   b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☒ Amendments to the claims of the International Aplication under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. ☒ are attached hereto (required only if not communicated by the International Bureau).
   b. ☐ have been communicated by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English lanugage translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.
14. ☐ A SECOND or SUBSEQUENT preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☐ Other items or information:

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
10/048199	PCT/EP00/07249	01-9198

	CALCULATIONS PTO USE ONLY	
21. [X] The following fees are submitted:		
BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):		
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a (2)) paid to USPTO and International Search Report not prepared by the EPO or JPO **$1000.00**		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO **$860.00**		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO **$710.00**		
International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) **$690.00**		
International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) **$100.00**		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$ 860.00	
Surcharge of **$130.00** for furnishing the oath or declaration later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$ 0.00	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	9 -20 =	0	x $18.00	$ 0.00	
Independent claims	1 -3 =	0	x $80.00	$ 0.00	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ $270.00	$ 0.00	

TOTAL OF ABOVE CALCULATIONS =	$ 860.00	
[X] Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2. +	$ 430.00	
SUBTOTAL =	$ 430.00	
Processing fee of **$130.00** for furnishing the English translation later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 CFR 1.492(f)).	$ 0.00	
TOTAL NATIONAL FEE =	$ 430.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +	$ 40.00	
TOTAL FEES ENCLOSED =	$ 470.00	
	Amount to be refunded:	$
	charged:	$

a. [X] A check in the amount of $ 470.00 to cover the above fees is enclosed.

b. [ ] Please charge my Deposit Account No. _____ in the amount of $ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. [X] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 03-2030 . A duplicate copy of this sheet is enclosed.

d. [ ] Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Daniel M. Cislo
Cislo & Thomas LLP
233 Wilshire Boulevard, Suite 900
Santa Monica, CA 90401-1211
USA

SIGNATURE

Daniel M. Cislo
NAME

32,973
REGISTRATION NUMBER

Practitioner's Docket No. 01-9198

CHAPTER II

Preliminary Classification:

Proposed Class:

Subclass:

TRANSMITTAL LETTER TO THE UNITED STATES ELECTED OFFICE (EO/US)

(ENTRY INTO U.S. NATIONAL PHASE UNDER CHAPTER II)

PCT/EP00/07249	27 July 2000 (27.07.00)	27 July 1999 (27.07.99)
International Application Number	**International Filing Date**	**International Earliest Priority Date**

TITLE OF INVENTION: SAFETY SYRINGE

APPLICANTS: BANG, Young Chul
MEDI plus TEC Medizinisch-technische Handelsgesellschaft mbH

Box PCT
Assistant Commissioner for Patents
Washington D.C. 20231
ATTENTION: EO/US

CERTIFICATION UNDER 37 C.F.R. SECTION 1.10*
*(Express Mail label number is **mandatory.**)*
(Express Mail certification is optional.)

I hereby certify that this paper, along with any document referred to, is being deposited with the United States Postal Service on this date January 25, 2002 in an envelope as "Express Mail Post Office to Addressee," mailing Label Number EL 780732496 US, addressed to the: Assistant Commissioner for Patents, Washington, D.C. 20231.

GISLO & THOMAS LLP

Robert J. Lauson, Esq.

WARNING: *Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R. Section 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.*

****WARNING***: *Each paper or fee filed by "Express Mail" **must** have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. Section 1.10(b).*
*"Since the filing of correspondence under [Section] 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will **not** be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.*

1. Applicant herewith submits to the United States Elected Office (EO/US) the following items under 35 U.S.C. Section 371:

a. This express request to immediately begin national examination procedures (35 U.S.C. Section 371(f)).

b. The U.S. National Fee (35 U.S.C. Section 371(c)(1)) and other fees (37 C.F.R. Section 1.492) as indicated below:

2. Fees

CLAIMS FEE	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
	TOTAL CLAIMS	9 -20 =	0	x $18.00 =	$0.00
	INDEPENDENT CLAIMS	1 - 3 =	0	x $80.00 =	$0.00
	MULTIPLE DEPENDENT CLAIM(S) (if applicable) + $270.00				$0.00
BASIC FEE	U.S. PTO WAS NOT INTERNATIONAL PRELIMINARY EXAMINATION AUTHORITY Where no international preliminary examination fee as set forth in Section 1.482 has been paid to the U.S. PTO, and payment of an international search fee as set forth in Section 1.445(a)(2) to the U.S. PTO: where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office (37 C.F.R. Section 1.492(a)(5)) $860.00				$860.00
	Total of above Calculations				= $860.00
SMALL ENTITY	Reduction by 1/2 for filing by small entity, if applicable. Affidavit must be filed. (note 37 CFR Sections 1.9, 1.27, 1.28)				- $430.00
	Subtotal				$430.00
	Total National Fee				$430.00
	Fee for recording the enclosed assignment document $40.00 (37 C.F.R. Section 1.21(h)). See attached "ASSIGNMENT COVER SHEET".				$40.00
TOTAL	Total Fees enclosed				$470.00

A check in the amount of $470.00 to cover the above fees is enclosed.

3. A copy of the International application as filed (35 U.S.C. Section 371(c)(2)) is transmitted herewith.

4. A translation of the International application into the English language (35 U.S.C. Section 371(c)(2)) is not required as the application was filed in English.

5. Amendments to the claims of the International application under PCT Article 19 (35 U.S.C. Section 371(c)(3)) are transmitted herewith.

6. A translation of the amendments to the claims under PCT Article 19 (38 U.S.C. Section 371(c)(3)) is not required as the amendments were made in the English language.

7. A copy of the international examination report (PCT/IPEA/409) is transmitted herewith.

8. Any Annexes to the international preliminary examination report is/are transmitted herewith.

9. A translation of the annexes to the international preliminary examination report is not required as the annexes are in the English language.

10. An oath or declaration of the inventor (35 U.S.C. Section 371(c)(4)) complying with 35 U.S.C. Section 115 is submitted herewith, and such oath or declaration is attached to the application.

II. OTHER DOCUMENT(S) OR INFORMATION INCLUDED

11. An International Search Report (PCT/ISA/210) or Declaration under PCT Article 17(2)(a) has been transmitted by the International Bureau on (from form PCT/IB/308): 11 December 2000.

12. An assignment document is transmitted herewith for recording.

13. The above items are being transmitted before 30 months from any claimed priority date.

AUTHORIZATION TO CHARGE ADDITIONAL FEES

The Commissioner is hereby authorized to charge any additional fees that may be required by this paper and during the entire pendency of this application to Account No.: 03-2030

Date: 25 JAN 02

Signature of Practitioner

Reg. No.: 32,973
Tel. No.: (310) 451-0647
Customer No.: 25,189

Robert J. Lauson, Esq.
CISLO & THOMAS LLP
233 Wilshire Boulevard, Suite 900
Santa Monica, CA 90401-1211
USA

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PCT NATIONAL PHASE
01-9198

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE as
PCT RECEIVING OFFICE

In re the application of:
BANG, Young Chul

Serial Number:	PCT/EPO/07249	U.S. Appl. Serial No.:	09/550,504
Filed:	27 July 2000	Earliest Priority Date:	27 July 1999
For:	SAFETY SYRINGE		

Assistant Commissioner of Patents
Washington, D.C. 20231
BOX PCT

PRELIMINARY AMENDMENT

Dear Sir:

Prior to undertaking examination, please amend without prejudice the above-identified application as follows:

In the Specification:

Please delete the sentence at page 17, lines 14-15 stating: "Besides this difference, the general structure and functioning of the first and second embodiment are more or less the same."

REMARKS

This preliminary amendment in this PCT application as the National Stage in the United States is entered.

The above statement is deleted as unnecessary to disclose the second embodiment.

It is not believed that any additional fees are due; however, in the event any additional fees are due, the Examiner is authorized to charge Applicant's attorney's deposit account no. 03-2030.

Respectfully submitted,

CISLO & THOMAS LLP

Date: January 25, 2002

Robert J. Lauson
Reg. No. 41,930

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3763

PCT NATIONAL PHASE
02-10548

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE as
PCT RECEIVING OFFICE

10/048199

In re the application of:

BANG, Young Chul

Serial Number: PCT/EPO/07249 U.S. Appl. Serial No.: ~~09/550,304~~ 09550584

Filed: 27 July 2000 Earliest Priority Date: 27 July 1999

For: SAFETY SYRINGE

Assistant Commissioner of Patents
Washington, D.C. 20231
BOX NON-FEE AMENDMENT

SECOND PRELIMINARY AMENDMENT

Dear Sir:

Prior to undertaking examination, please amend without prejudice the above-identified application as follows:

In the Claims:

Please delete claims 1-9.

Please add the following new claims 10-20:

10. A safety syringe, having a cylinder, a syringe needle, a needle holder associated to the cylinder and adapted to hold the syringe needle and a plunger associated to the cylinder, wherein the plunger comprises a piston and serves to inject a filling of the cylinder via the syringe needle, wherein the plunger can be

coupled with the needle holder arranged in the region of a front hole of the cylinder to retract the needle holder together with the syringe needle into the cylinder by pulling the plunger, and wherein the needle holder is fixed or fixable in the region of the front hole to the cylinder by a groove-projection-arrangement having axially extending grooves with wide tapered groove entrances for receiving a respective projection so that the projections, after having passed the wide entrances and the axially extending grooves, can be rotated with respect to the axially extending grooves, to axially fix the needle holder in the region of the front hole against retraction into the cylinder.

11. A syringe according to claim 10, characterized in that the groove-projection-arrangement is arranged such that the needle holder, which is fixed in the region of the front hole to the cylinder, can be released for retraction into the cylinder by rotating the needle holder with respect to the cylinder.

12. A syringe according to claim 11, characterized in that the coupling between the plunger and the needle holder is adapted, to effect a rotation of the needle holder with respect to the cylinder by rotating the plunger, which is coupled with the needle holder, with respect to the cylinder.

13. A syringe according to one of the preceding claims, characterized in that the groove-projection-arrangement comprises grooves located on the outer cylindrical surface of the needle holder and projections located in the region of the front hole on an inner surface of the cylinder to be received in said grooves.

14. A syringe according to claim 13, characterized in that said grooves have a first portion which substantially extends in axial direction, and a second portion which substantially extends in a circumferential direction, so that the grooves are substantially L-shaped.

15. A safety syringe, having a cylinder, a syringe needle, a needle holder associated to the cylinder and adapted to hold the syringe needle, and a plunger associated to the cylinder, wherein the plunger comprises a piston and serves to inject a filling of the cylinder via the syringe needle, wherein the plunger can be coupled with the needle holder arranged in the region of a front hole of the cylinder, to retract the needle holder together with the syringe needle into the cylinder by pulling the plunger, and wherein the needle holder is fixed or fixable in the region of the front hole to the cylinder by a groove-projection-arrangement, said groove-projection-arrangement comprising grooves located on an outer cylindrical surface of the needle holder and projections located in the region of the front hole on an inner surface of the cylinder to be received in said grooves, said grooves having a first portion which substantially extends in an axial direction, and a second portion which substantially extends in a circumferential direction, so that the grooves are substantially L-shaped.

16. A syringe according to claim 15, characterized in that the groove-projection-arrangement is arranged such that the needle holder, which is fixed in the region of the front hole to the cylinder, can be released for retraction into the cylinder by rotating the needle holder with respect to the cylinder.

17. A syringe according to claim 16, characterized in that the coupling between the plunger and the needle holder is adapted, to effect a rotation of the needle holder with respect to the cylinder by rotating the plunger, which is coupled with the needle holder, with respect to the cylinder.

18. A syringe according to one of the preceding claims, characterized in that the plunger has a predetermined breaking point, to allow that a re-use of the syringe can be inhibited by breaking the plunger.

19. A syringe according to one of the preceding claims, characterized in that the plunger carries a cap, which can be inserted in the front hole of the cylinder after retraction of the syringe needle into the cylinder.

20. A syringe according to claim 18, characterized in that after breaking the plunger a part of the plunger can be inserted in the front hole of the cylinder after retraction of the syringe needle into the cylinder.

21, A syringe according to one of the preceding claims, characterized in that the plunger and the needle holder can be coupled by a snap-in connection.

Respectfully submitted,

CISLO & THOMAS LLP

Date: April 1, 2002

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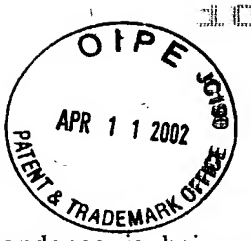

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to:

BOX NON-FEE AMENDMENT
Assistant Commissioner for Patents
Washington, D.C. 20231

on 4-1-02

Daniel M. Cislo, Reg. No. 32,973 — 4-1-02 Date

PCT INTERNATIONAL APPLICATION
01-9198

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE as
PCT RECEIVING OFFICE

In re the application of:
BANG, Young Chul, et al.

Serial Number:	PCT/EPO/07249	U.S. Appl. Serial No.:	09/550,504
Filed:	27 July 2000	Earliest Priority Date:	27 July 1999
For:	SAFETY SYRINGE		

Assistant Commissioner of Patents
Washington, D.C. 20231
BOX PCT

ASSERTION OF SMALL ENTITY STATUS

Dear Sir or Madam:

Applicant and Inventor above, hereby claims small entity status under 37 C.F.R. § 1.9 as an independent inventor. It is not believed that any additional fees are due; however, in the event any additional fees are due, the Examiner is authorized to charge Applicant's attorney's deposit account no. 03-2030.

Respectfully submitted,

CISLO & THOMAS LLP

Date: January 25, 2002

Robert J. Lauson
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SAFETY SYRINGE

This invention relates to a safety syringe, which has a cylinder, a syringe needle, a needle holder associated to the cylinder and adapted to hold the syringe needle, and a plungerassociated to the cylinder, wherein the plunger comprises a piston and serves to inject a filling of the cylinder via the syringe needle.

The invention provides a syringe having the features of claim 1. For particular high safety, the features of claim 2 are suggested. Advantages with respect to the safefty are also obtained for the features of claim 3 or - alternatively - of claim 4. Substantial advantages are further obtained from the features of at least one of claims 5 to 8, which concern the coupling of the plunger with the needle holder and the fixation of the needle holter to the cylinder in the region of a front hole of the cylinder. Other possible features of a syringe according to the invention, which give further advantages, can be found in the following specification or/and in the figures.

A first embodiment, which serves to illustrate a syringe according to a first aspect of the invention, is shown in figures 1 to 11. The figures show:

Fig. 1; Cross-sectional view of the parts.
Fig. 2; Squint view of the parts.
Fig. 3; Lateral view of the cylinder.
Fig. 4; Lateral view of the syringe needle inserter.
Fig. 5; Front view of the syringe needle inseter.
Fig. 6; A-A line cross-sectional view of the Fig. 5.
Fig. 7; B-B line cross-sectional view of the Fig. 5.
Fig. 8; Front view of the plunger.
Fig. 9; Cross-sectional view of this device when injection is completed.
Fig.10; Cross-sectional view of the device when plunger meets the syringe needle fixer upon completion of injection.
Fig.11; Cross-sectional view of this device which shows the breaking of the plunger after pulling the plunger back into the cylinder in order to keep t the syringe needle an the syringe needle fixer inside the cylinder.

A second embodiment, which serves to illustrate a syringe according to a second aspect of the invention, is shown in figures 12 to 25. The figures show:

FIGURE 12 -A PARTIAL LONGITUDINAL CROSS-SECTION OF THE SYRINGE

FIGURE 13 -AN ISOMETRIC EXPLODED VIEW OF A NEEDLE INSERTING DEVICE

FIGURE 14 -A VIEW OF THE PLUNGER

FIGURE 15 -A LONGITUDINAL CROSS-SECTION OF THE SYRINGE WITHOUT NEEDLE

FIGURE 16 -A LONGITUDINAL CROSS-SECTION OF THE SYRINGE WITHOUT NEEDLE THAT THE PLUNGER IS ASSEMBLED WITH THE NEEDLE NEEDLE INSERTING DEVICE

FIGURE 17 -A PARTIAL CROSS-SECTION SHOWS BREAKING OFF THE PLUNGER AFTER INJECTION

FIGURE 18 -A LONGITUDINAL CROSS-SECTION OF THE SYRINGE COVERED WITH A PART SEPARATED FROM THE PLUNGER

FIGURE 19 -A LONGITUDINAL VIEW OF THE NEEDLE INSERTING DEVICE

FIGURE 20 -A A-A LINE CROSS-SECTION IN FIGURE 12

FIGURE 21 -A ANOTHER A-A LINE CROSS-SECTION IN FIGURE 12

FIGURE 22 -A B-B LINE CROSS-SECTION IN FIGURE 12

FIGURE 23 -A C-C LINE CROSS-SECTION IN FIGURE 19

FIGURE 24 -A E-E LINE CROSS-SECTION IN FIGURE 19

FIGURE 25 -A F-F LINE CROSS-SECTION IN FIGURE 19

The first embodiment and/or the second embodiment serve to illustrate further aspects of the invention.

In the following, a safety syringe according to the first aspect and further aspects of the invention is explained.

This device is for a safety syringe preventing a third person from getting damaged by the used syringe needles. It is designed to keep the syringe needle in custody of syringe cylinder once used so that a third person may not be pricked by the used needles. The plunger shall then be broken after use in order to prevent from being used again.

In order to prevent repeated use of syringe neeldes by far, it is the current phenomenon that disposable syringes are predominantly being used. Such conventional disposable syringes have been technically designed to prevent to be reused.

The conventional disposable syringes are, however, after being used, usually or frequently being disposed or not properly dealt with the needles and thus a third person may be easily pricked. Such problems of giving damages to a third party have not been solved.

Because the syringe needles always have blood stain, in case medical workers including doctors and nurses as well as a third party get pricked by an used syringe needles they are very much concerned of being infected by the disease of the patients (AIDS, hepatitis, etc.) and such cases have been reported.

This device is a safety syringe system which prevents disease from being infected to a third party via used syringe needles by keeping it inside the syringe cylinder.

According to this device, the used needle does not need to be taken off from the syringe after use, but, instead, it is pulled into the cylinder to be fixed and kept in custody inside cylinder. And by doing this, infections of disease to a third party by getting pricked can be prevented.

My previous patent application of this nature regarding safety syringe system have been published on the Utility Model Announcement Korea Utility Model No.91-4532 and Open Utility Model Public News Korea Utility Model No.96-13409.

This device is to introduce more advanced safety syringe system which is simpler in structure and more reliable in affect compared with the above-said previous patent.

Technical Target that this device pursue to accomplish.

My previous safety syringe system published on the Utility Model Announcement

No.91-4532 and Open Utility Model Public News No.96-13409 was to have the needleset fixed to the plunger so that the syringe needle can be kept inside cylinder when the plunger is pulled back.

The disposable syringe that I have patented as above had some defects requiring a host of parts and extreme preciseness whereby creating difficulties in manufacturing. This device has been developed instead. It is simpler in structure, easier in manufacturing, has eliminated the possibility of mis-use and requires less number of parts

In the following it is referred to Fig. 1 to 11.

Structure and action of the device.

It has cylinder for injection. Inside the cylinder are piston and plunger. In a syringe Which the dead-end of the cylinder has a syringe needle usually affixed, cylinder(11), syringe needle(21), syringe needle inserter(31) and plunger(41) are the parts in structure. At the end of inserting hole of the cylinder are a host of projection(13) and incised grooves arranged alternately. On the inner face of the cylinder are stopping sill(15) and obstacle (hooking?) sill at the rear end. At the center of the syringe needle inserter(31) is the syringe needle fixer(32). On the outer face(33) of barrel shaped syringe needle fixer(32) are number of "ㄱ" shaped grooves(34) for projections(13) to enter. Packing(35) is placed in its rear. Inside of the rear-end are projections prominence(36) on the top and bottom. Inside both of the up/down projections aforesaid is formed the obstacle(hooking) inside ring stopper(37). On the tip of the plunger(41) where piston(42) is inserted are top/bottom conecting device(43) which have hooking sills(43'). On the both sides of the central projection(44) are erected projctions(44'). At the end of the plunger(41) where piston(42) is inserted forms a space(47). Pressing button (48) at the rea part of the plunger(41) has a inserting groove(48'). The inserting groove(48') is for the cap(49) to be inserted to cover the inserting hole(12) of the cylinder tip.

In oredr for the plunger(41) to be easily broken, in the fore part of the plunger(41) are many "V" shaped grooves or holes and at the rear part of the piston(42) of plunger(41) is formed a stopping ring sill(50).

This device with such structure will act as follows:

Cylinder(11) and the syringe needle inserter(31) are combined together by thrusting the needle inserter(31) from the rear end of the cylinder (11) to the inside of the cylinder until the projections (13) on the inner face of the cylinder(11) insert hole(12) meet and set in the "¬" shaped grooves formed on the outer face of the barrel shaped needle inserter(31).

Then the piston(42) inserted plunger(41) is pushed into the rear side of the cylinder(11). Right before the use of the syringe, syringe needle(21) is fixed in the syringe needle inserter(31) as uasual. Injection is sucked into the cylinder(11) by pulling the plunger backward. Injection is done to the patient by pushing the plunger(41).

At the time when the syringe needle inserter(31) is fixed to the cylinder(11) from the rear toward inner side, it has to be pushed until the projections(13) of inserting hole(12) of the cylinder set in toward the circumference direction of the "¬" shaped grooves of the syringe needle inserter(31). At this time, the incised grooves between projections(13) will help syringe needle inserter(31) entering into the cylinder(11) by making the cylinder(11) tip bursted open so that the needle inserter(31) can be easily set in.

The stopping sill(15) of the inner face of the cylinder(11) joints the rear tip of the syringe needle inserter(31). The packing(35) inserted in the syringe needle inserter(31) will closely adhere to the inner face of the cylinder(11).

When the syringe inserter(31) is inserted by force into the inserting hole(12) of the cylinder(11) tip in order to fix the syringe needle inserter(31) onto the cylinder's(11) tip, the projections(13) of the inner face of the cyllinder(11) will be hooked on any of the "¬ " shaped arooves (34) of the outer face of the syringe needle inseter(31), that is, on the groove of any location in circumference direction, but as the syringe needle inserter(31) turns accordingly when we trun and fix the syringe needle(21) in the syring needle inseter(31), the projections (13) erected in the inserting hole(12) of the cylinder(11) will become to locate at the last of the "¬" shaped grooves as soon as the syringe needle is fixed in.

Moreover, as the meeting places of the "ㄱ" shaped grooves are not flat but are "U" or "^" shaped, the projections(13) of cylinder(11) cannot be located on the border between the "ㄱ" shapes.

Like this, the syringe needle inserter (31) and syringe needle are fixed at the cylinder(11) tip, and by thrusting the plunge(41) into the cylinder(11), syringe assembly is completed. The syringe sucks the injection into the cylinder(11) when the plunger(41) is pulled back. After plucking the needle(21) from the patient(Ref. Fig.9) upon completion of injection, if we apply force to push the plunger(41) forward (Ref.Fig.10), piston(42) is being pressed so as for its volume to become smaller by the space (47) formed inside of the pistion (42), and at the same time, the respective hooking sills(43') of upper and lower connecting device(43) formed up and down the plunge(41) is inserted in the obstacle ring sill (37) of

the inner face of the rear part syringe needle inserter(31), plunger(41) tip and the syringe needle inserter(31) rear part will be combinde together. when the plunger(41) is turned, the projection (44') erected both sides of the central projection (44) of the plunger tip will joint the up/down projections(36) of the rear inner face of the syringe needle inserter(31). and the truning plunge(41) will trun the syringe needle inserter(31).

The syringe needle inserter (31) which is truned by the plunger (41) is again turning the "ㄱ" shaped grooves (34), then the projections(13) of the cylinder(11) will turn the straight line of the "ㄱ" shaped grooves(34). When the plunger is drawn back, the projections (13) will be pushed forward along the straight lines of "ㄱ" shaped grooves, and at the same time, the needle inserter(31) as well as the syringe needle(21) which is inserted thereto will be pushed back to inside of cylinder(11).

Backtracking plunger(41) will retreat until the plunger ring sill (40) reaches the hooking sill (16), then plunger (41) is to be broken. Then all the operation comes to and end by trans-inserting the cap(49) which is inserted in the pressing hole(48) into the inserting hole(12) in front of the cylinder(11).

In the cap's(49) inserting hold is prepared a ring(circular) sill and because the ring sill of the cap(49) insert hole is to meet the projection(13)of the insert hole(12) of cylinder(11), the cap inserted in the insert hole(12) would not easily come out.

Effect of this device.

This device is designed to withhold the used syringe needle inside the cylinder, the main body of syringe, and whereby to prevent the possible damages which may happen to medical workers including doctors and nurses as well as a third paty from being pricked by the used syringe needles.

The syringe needs to be dealt with utmost care regardless before of after use, due to the sharp-pointed needles. A special attention is required to be paid to the used ones because of the blood stain. Especially, because hepatitis and AIDS are infectious to a third party via blood stain, the syringes used ofr patients of such disease must be handled with special attention.

However, as described in this device, if we insert the used syringe needle into the cylinder and then break the plunger, the syringe needle will be located inside the cylinder. If we cover the cylinder with the cap prepared in the rear of the plunger, there is no possibility at all for the syringe needle inside the cylinder to be exposed out of the cylinder and can

be kept safely in custody until further process.
If we use this device, we cannot re-use the used syringes. Therefore, it is very useful device as it can prevent disease caused by the used syringe needles frome being infectious to a third person.

This device is designed to keep the used syringe needle inside the cylinder prohibiting re-use of the used syringe needles in order to prevent possible damages for medical workers including doctors and nurses and a third party alike to be taken from being pricked by the used syringe needles. The syringe needle which is fixed in the syringe needle fixer is set at the tip of cylinder with the help of the syringe needle inserter.

Inserting part is composed at the projection of the tip of the plunger which is to be put in the cylinder. At the rear end of the syringe needle fixer is formed the assembling part. The projection of the plunger joints the syringe needle fixer. When plunger is drawn back, syringe needle fixer with its needle fixed in will also be drawn back and kept inside the cylinder. Thus, damages by the used syringe needle can be prevented. This device is of the safety syringe which can prevent in infectious diseases such as hepatitis and AIDS.

Some important aspects of the safety syringe according to the first embodiment are as follows:

It has cylinder to suck in injection. Piston and plunger are in the cylinder while the ordinary syringe has the syringe needle affixed to the syringe, this device has the cylinder(11), syringe needle(21), syringe needle inserter(31) and plunger respectively as parts of its structure. At the insert hole(16) of the above said cylinder (11) tip are a host of projections(13) and incised grooves(14) arranged alternatively one after another.
Cylinder's(11) inner face has stopping sill and hooking sill in the rear. At the center of the syringe needle inserter is a syringe needle fixer to fix syringe needle. Outer barrel shaped outer face of the syringe needle fixer has a number of "ㄱ" shaped grooves for projections(13) formed on the inner face of the insert hole(12) to set in. packing(35) is set in the rear. On the upper and lower part of the inner face of the rear part are projections(36). Inside the upper and lower projections(16) is hooking ring sill(37). At the plunger(41) tip where piston is inserted in are top and bottom joints connecting device which has hooking sill(43'). On both sides of the central projection(44) inside the top/bottom joint connecting device. Space (47) is formed at the pluger(41) tip where piston is inserted in. At the pressing/pushing button(48) of the rear end of the plunger(41) has the insert groove(48'). In the insert groove(48'), a cap(49) is supposed to be inserted to cover insert hole(12) of the cylinder tip.

In the following, a safety syringe according to the second aspect and further aspects of the invention is explained.

THIS DEVICE RELATES TO A SAFETY SYRINGE SO AS TO PREVENT A PRICKING OF OTHER PERSON BY MEANS OF WITHDRAWING A NEEDLE IN THE INSIDE OF A BARREL KEEPING IN IT AFTER INJECTION AND THE REUSE OF A SYRINGE BY MEANS OF BREAKING OFF A PLUNGER.

THE PRIOR SINGLE USE SYRINGE WHICH A TECHNICAL METHOD IS APPLIED TO IN ORDER TO PREVENT THE REUSE OF A USED SYRINGE WAS USUAL.

BUT THERE WAS THE POSSIBILITY OF PRICKING BY A USED NEEDLE BECAUSE THE PRIOR SINGLE USE SYRINGE IS LEFT OR THROWN AWAY, HOLDING THE NEEDLE ON THE SYRINGE. THUS THE PROBLEM THAT OTHER PERSON MIGHT BE DAMAGED WITH THE USED NEEDLE COULDN'T BE SOLVED BY THE SINGLE USE SYRINGE.

THAT IS, SOME BLOOD IS LEFT ON THE NEEDLE AFTER INJECTION. IN THAT CASE, IF DOCTOR, NURSE, MEDICAL EMPLOYEE OR OTHER PERSON WAS PRICKED BY THE USED NEEDLE, THEY MIGHT BE INFECTED WITH THE DISEASE OF THE PATIENT(SUCH AS AIDS, HEPATITIS AND THE LIKE) BY IT. THE EXAMPLES ARE ACTUALLY REPORTED.

THIS DEVICE RELATES TO THE SAFETY SYRINGE SO AS TO PREVENT TRANSMITTING THE INFECTIOUS DISEASES THROUGH THE USED NEEDLE, WITHDRAWING THE USED NEEDLE INTO THE INSIDE OF A BARREL AND KEEPING IT IN A BARREL WITHOUT REMOVAL OF THE NEEDLE, AFTER INJECTION.

AS A PRIOR PATENT DOCUMENTS ON A SAFETY SYRINGE, THERE IS UTILITY MODEL ANNOUNCEMENT #91-4532 AND OPEN UTILITY MODEL ANNOUNCEMENT #96-13409 WHICH WERE APPLIED BY THIS APPLICANT AND WERE ANNOUNCED. AND ALSO THIS APPLICANT APPLIED FOR UTILITY MODEL OF A SAFETY SINGLE USE SYRINGE IN UTILITY MODEL APPLICATION #7783 IN 1999.

THIS DEVICE HAS MORE SIMPLE STRUCTURE AND EXACT FUNCTION THAN PRIOR SYRINGES WHICH WAS APPLIED BY THIS APPLICANT BEFORE.

THE SAFETY SYRINGES THAT THE NEEDLE SET IS FIXED TO THE PLUNGER, WITHDRAWN INTO THE INSIDE OF A BARREL AND KEPT IN IT AFTER INJECTION ARE SHOWN IN UTILITY MODEL ANNOUNCEMENT #91-4532, OPEN UTILITY MODEL #98-13409 AND UTILITY MODEL APPLICATION #7783, WHICH WERE APPLIED BY THIS APPLICANT AND ANNOUNCED.

THE PRIOR SINGLE USE SYRINGES WHICH WERE APPLIED FOR UTILITY MODEL BY THIS APPLICANT HAD A PROBLEM IN MANUFACTURING BECAUSE THOSE NEED A GREAT NUMBER OF PARTS AND HIGH PRECISION.
AS THIS DEVICE IS NEWLY DEVELOPED IN ORDER TO REMOVE THE DEMERITS, IT NEEDS FEW NUMBER OF PARTS, THE STRUCTURE IS SIMPLE, MANUFACTURING IS EASY AND THE POSSIBILITY OF THE INCORRECT OPERATION GETS REMOVED.

In the following it is referred to Fig. 12 to 25.

[STRUCTURE OF DEVICE]

SAME AS A GENERAL SYRINGE HAS A BARREL WHICH MEDICATION IS SUCKED INTO, A PISTON AND A PLUNGER IN THE INSIDE OF A BARREL.

THIS SAFETY SINGLE USE SYRINGE IS COMPOSED OF A BARREL(11), A NEEDLE(21), A PLUNGER(41) AND A NEEDLE INSERTING DEVICE(31) TO WHICH A NEEDLE(21) IS ATTACHED. A NUMBER OF PROJECTIONS(13) ARE IN THE INSIDE OF THE FRONT END OF AN INSERTING HOLE(12) OF THE ABOVE BARREL(11), AN ANNULAR STOP PROMINENCE(15) IS ON THE INNER CIRCUMFERENTIAL SURFACE OF A BARREL(11), AN ANNULAR RESTRAINING PROMINENCE(16) IS AT THE REAR END OF A BARREL. A NEEDLE LOCKING DEVICE(32) TO ATTACH A NEEDLE(21) IS AT THE CENTER OF A NEEDLE INSERTING DEVICE(31), A NUMBER OF "¬" SHAPED FEMALE GROOVES(34) HAVING THE WIDE ENTRANCES IN ORDER TO BE ASSEMBLED WITH A PROJECTION(13) LOCATED AT AN INNER SURFACE OF AN INSERTING HOLE(12) OF THE ABOVE CYLINDRICAL BARREL(11) ARE ON THE OUTER CYLINDRICAL SURFACE(33) OF A NEEDLE LOCKING DEVICE(32), A O-RING(35) IS INSERTED AT THE REAR OF THE GROOVES, A NUMBER OF FEMALE GROOVES(37) ARE IN THE INSIDE OF A NEEDLE INSERTING DEVICE(36), A

MALE EXTENSIONS(43) HAVING EACH RESTRAINING PROMINENCE(43') ARE AT THE FRONT END OF A PLUNGER(41) TO BE ASSEMBLED WITH A PISTON(42), AN EMPTY SPACE(47) IS AT THE FRONT END OF A PLUNGER(41) TO BE ASSEMBLED WITH A PISTON(42), A CUTTING NOTCH(45) IS AT THE FRONT PART OF A PLUNGER(41) IN ORDER TO BE EASILY BROKEN OFF, A ANNULAR STOP PROMINENCE(50) IS AT THE REAR PART OF A PLUNGER(41), REAR STOP PROJECTIONS(51) ARE AT THE LONGITUDINAL CENTER OF A PLUNGER, AN EMPTY SPACE(53) IS LONGITUDINALLY IN THE CENTRAL INSIDE OF A PLUNGER(41) BETWEEN REAR STOP PROJECTIONS(51) AND CUTTING NOTCH.

THE DEVICE HAVING THIS STRUCTURE OPERATES AS FOLLOWS.

A NEEDLE INSERTING DEVICE(31) IS INSERTED INTO A BARREL FROM THE BACK END OF A BARREL(11) AND PUSHED TOWARDS THE FRONT END UNTIL A NUMBER OF PROJECTIONS(13) IN THE INSIDE OF A INSERTING HOLE(12) OF A BARREL(11) REACHES THE END OF "¬" SHAPED GROOVE(34) HAVING A WIDE ENTRANCE ON THE CYLINDRICAL OUTER SURFACE(33) OF A NEEDLE INSERTING DEVICE(31), AND ASSEMBLED WITH A BARREL(11).

AND THEN A PLUNGER(41) ASSEMBLED WITH A PISTON(42) IS INSERTED INTO A BARREL FROM THE BACK END OF A BARREL(11) AND A NEEDLE(21) IS PUT INTO A NEEDLE INSERTING DEVICE(31) JUST BEFORE USING A SYRINGE. A PLUNGER(41) IS PULLED BACK AND MEDICATION IS SUCKED INTO THE INSIDE OF A BARREL(11) AS USUAL. MEDICATION IS INJECTED INTO A PATIENT'S BODY, A PLUNGER(41) BEING PUSHED.

WHEN AN NEEDLE INSERTING DEVICE(31) IS INSERTED INTO A BARREL(11) FROM THE BACK END OF A BARREL(11) AND FIXED TO A BARREL, A NEEDLE INSERTING DEVICE(31) IS PUSHED INTO A BARREL UNTIL A NUMBER OF PROJECTIONS(13) IN THE INSIDE OF AN INSERTING HOLE(12) OF A BARREL(11) REACHES THE END OF THE "¬" SHAPED GROOVE(34) HAVING THE WIDE ENTRANCE ON THE OUTER SURFACE OF A NEEDLE INSERTING DEVICE(31). IN THIS CASE A ANNULAR STOP PROMINENCE(15) ON THE INNER SURFACE OF A BARREL(11) MEETS THE BACK END OF A NEEDLE INSERTING DEVICE(31) AND AN O-RING(35) INSERTED INTO A NEEDLE INSERTING DEVICE(31) CLINGS TO THE INNER CYLINDRICAL SURFACE OF A BARREL(11) SO THAT SEALING IS COMPLETELY KEPT.

WHEN A NEEDLE INSERTING DEVICE(31) IS PUSHED INTO AN INSERTING HOLE(12) AT THE FRONT END OF A BARREL(11) AND LOCKED, THE PROJECTIONS(13) ON THE INNER CIRCUMFERENTIAL SURFACE OF A BARREL(11) IS POSITIONED AT THE BACK END(THE ENTRANCE OF THE GROOVE) OF THE "¬" SHAPED FEMALE GROOVE(34) HAVING THE WIDE ENTRANCE ON THE OUTER CIRCUMFERENTIAL SURFACE OF A NEEDLE INSERTING DEVICE(31). BUT WHEN A NEEDLE(21) IS PUT INTO A NEEDLE INSERTING DEVICE(31) AND LOCKED, THE MALE PROJECTIONS(13) IN THE INSIDE OF AN INSERTING HOLE(12) OF A BARREL(11) IS POSITIONED AT THE END OF "¬" SHAPED FEMALE GROOVE(34) BECAUSE BOTH THE NEEDLE(21) AND THE NEEDLE INSERTING DEVICE(31) IS ROTATED TOGETHER.

THUS, A NEEDLE INSERTING DEVICE(31) AND A NEEDLE (21) IS AT THE FRONT END OF A BARREL(11) AND A PLUNGER(41) IS INSERTED INTO A BARREL(11) SO THAT THE ASSEMBLY OF A SYRINGE IS FINISHED. THE PLUNGER(41) IS PULLED BACK, THE MEDICATION IS SUCKED INTO A BARREL AND IT IS INJECTED TO A PATENT'S BODY. AFTER MEDICATION IS INJECTED TO A BODY AND A NEEDLE(21) IS WITHDRAWN FROM IT, AS ADDITIONAL FORCE IS APPLIED TO A PLUNGER(41) (FIGURE 5), A PISTON(42) WHICH HAS AN EMPTY SPACE(47) INSIDE IS PRESSED AND SQUEEZED. AT THE SAME TIME EACH RESTRAINING STOP PROJECTION(43') OF A LOCKING DEVICE(43) IS LOCKED IN THE INSIDE OF A FEMALE GROOVE(37) LOCATED AT THE OUTSIDE OF A CENTRAL HOLE OF A NEEDLE INSERTING DEVICE(31) SO THAT THE FRONT END OF A PLUNGER(41) IS CONNECTED WITH THE BACK END OF A NEEDLE INSERTING DEVICE(31). THEREAFTER, IF A PLUNGER IS ROTATED, A NEEDLE INSERTING DEVICE(31) IS ROTATED TOGETHER BY IT.

THUS A "¬" SHAPED FEMALE GROOVE(34) ON THE OUTER SURFACE OF A NEEDLE INSERTING DEVICE(31) ROTATED BY A PLUNGER(41) IS ROTATED TOGETHER SO THAT PROJECTIONS(13) ON THE INNER CIRCUMFERENTIAL SURFACE OF THE FRONT END OF A BARREL(11), WHICH ARE POSITIONED CIRCUMFERENTIALLY IN A "¬" SHAPED FEMALE GROOVE(34), ARE ROTATED UNTIL THE STRAIGHT LINE OF A "¬" SHAPED FEMALE GROOVE(34). AFTER THAT, WHEN A PLUNGER(41) IS PULLED BACK, PROJECTIONS(13) IS MOVED FORWARD THROUGH THE STRAIGHT LINE OF A "¬" SHAPED FEMALE, AND SIMULTANEOUSLY A NEEDLE INSERTING DEVICE(31) WITH AN ATTACHED NEEDLE(21) IS MOVED BACK INTO A BARREL(11) AND KEPT INSIDE.

A PLUNGER(41) IS MOVED BACKWARDS UNTIL AN PLUNGER ANNULAR PROMINENCE(50) REACHES AN RESTRAINING ANNULAR PROMINENCE(16) OF A BARREL. AND THEN, A PLUNGER IS BROKEN OFF AT A CUTTING NOTCH(45). THUS THE BROKEN PLUNGER(42) IS INSERTED INTO A BARREL FROM THE FRONT END OF A BARREL. IN OTHER WORDS, A REAR RESTRAINING STOP PROJECTION(51) OF A PLUNGER(41) IS INSERTED UNTIL IT REACHES THE INSIDE OF A PROJECTION(31) LOCATED IN THE INSIDE OF A FRONT INSERTING HOLE(12) OF A BARREL(11). A PLUNGER(41) WHICH IS LOCKED IN AN INSERTING HOLE(12) IS NOT PULLED BACK EASILY BECAUSE A REAR RESTRAINING STOP PROJECTIONS(51) IS ENGAGED WITH A PROJECTION(31) IN THE FRONT END OF A INSERTING HOLE.

CONSEQUENTLY, A NEEDLE INSERTING DEVICE(31) INCLUDING A NEEDLE(21) IS THROUGHLY INSERTED INTO THE INSIDE OF A BARREL(11). A NEEDLE STORED IN THE INSIDE OF A BARREL IS SAFELY KEPT IN BECAUSE A INSERTING HOLE(12) IS BLOCKED BY A BROKEN PLUNGER(41).

[EFFECT OF DEVICE]

THIS DEVICE CAN PREVENT A PRICKING OF DOCTOR, NURSE AND OTHER MEDICAL EMPLOYEE BECAUSE A NEEDLE USED FOR A PATIENT IS INSERTED INTO THE INSIDE OF A BARREL AND KEPT IN.

A SYRINGE HAVING A SHARP NEEDLE SHOULD BE TREATED WITH MUCH CARE, WHETHER IT IS USED OR NOT. ESPECIALLY, IN CASE OF A BLOOD-STAINED NEEDLE USED FOR A PATIENT, IT SHOULD BE TREATED MOST CAREFULLY.

THE DISEASES SUCH AS HEPATITIS, AIDS AND THE LIKE CAN BE TRANSMITTED THROUGH BLOOD. THEREFORE, A NEEDLE USED FOR SUCH A PATIENT SHOULD BE HANDLED WITH UTMOST CARE.

THIS DEVICE HAS AN ADVANTAGE THAT A NEEDLE IS SAFELY KEPT IN A BARREL BECAUSE A PLUNGER IS BROKEN OFF AFTER A NEEDLE OF A SYRINGE IS THROUGHLY INSERTED INTO A BARREL. A BROKEN-OFF PLUNGER IS INSERTED INTO A BARREL THROUGH AN INSERTING HOLE. AN INSERTING HOLE IS BLOCKED WITH A BROKEN PLUNGER SO THAT A NEEDLE CAN BE KEPT IN AND TREATED SAFELY.

THUS THIS IS A USEFUL DEVICE WHICH MAKES A USED SYRINGE NOT TO BE REUSED AND PREVENTS INFECTIOUS DISEASES FROM SPREADING.

THIS RELATES TO A DEVICE FOR PREVENTING THAT DISPOSABLE SYRINGE IS REUSED AND THAT DOCTORS, NURSES, MEDICAL EMPLOYEES OR OTHERS ARE PRICKED BY THE USED NEEDLE BY MEANS OF INSERTING IT INTO A BARREL AFTER INJECTION. THE NEEDLE IS ATTACHED TO THE FRONT OF A BARREL WITH A NEEDLE INSERTING DEVICE, AN INSERTING PART IS MADE ON MALE EXTENSIONS IN THE FRONT END OF THE PLUNGER WHICH IS INSERTED INTO A BARREL AND A CONNECTING PART IS MADE IN THE BACK END OF A NEEDLE INSERTING DEVICE. A MALE EXTENSION OF A PLUNGER IS ASSEMBLED WITH A NEEDLE LOCKING DEVICE AND A NEEDLE INSERTING DEVICE WHICH A NEEDLE IS ATTACHED TO IS INSERTED INTO A BARREL WHEN A PLUNGER IS PULLED BACK. A NEEDLE INSERTING DEVICE IS KEPT IN THE INSIDE OF A BARREL. THEREFORE, USER DOESN'T BE PRICKED BY THE USED NEEDLE. CONSEQUENTLY, THIS SAFETY SYRINGE CAN PREVENT INFECTIOUS DISEASES SUCH AS HEPATITIS AND AIDS FROM SPREADING.

Some important aspects of the safety syringe according to the second embodiment are as follows:

THIS SAFETY SINGLE USE SYRINGE IS COMPOSED OF A BARREL(11), A NEEDLE(21), A PLUNGER(41) AND A NEEDLE INSERTING DEVICE(31), SAME AS A GENERAL SYRINGE WHICH HAS A BARREL INTO WHICH THE LIQUID MEDICINE IS SUCKED, A PISTON AND A PLUNGER INSIDE THE BARREL, AND A NEEDLE IS PUT ON THE FRONT TIP OF THE BARREL.
THERE IS A NUMBER OF PROJECTIONS(13) IN THE INSIDE OF THE FRONT END OF AN INSERTING HOLE(12) OF THE ABOVE BARREL(11). THE CIRCULAR STOP PROMINENCE(15) AT THE INNER SURFACE OF A BARREL(11), A CIRCULAR RESTRAINING PROMINENCE(16) INSIDE THE REAR END OF A BARREL, A NEEDLE FIXING DEVICE(32) TO INSERT A NEEDLE(21) AT THE CENTER OF A NEEDLE INSERTING DEVICE(31), A NUMBER OF "¬" SHAPED GROOVES(34) WITH THE WIDE ENTRANCES AT AN OUTER SURFACE(33) OF A CYLINDRICAL PART OF A NEEDLE FIXING DEVICE(32) IN ORDER TO BE ASSEMBLED WITH A PROJECTION(13) LOCATED AT AN INNER SURFACE OF AN INSERTING HOLE(12) OF THE ABOVE CYLINDRICAL BARREL(11), A O-RING(35) IN THE REAR OF THE GROOVES, A NUMBER OF THE INSERTING GROOVES(37), A CONNECTING DEVICE(43) OF UPPER AND LOWER PART WITH RESTRAINING PROMINENCES(43') AT THE FRONT END OF A PLUNGER(41) TO BE ASSEMBLED WITH A PISTON(42), AN EMPTY PART(47) AT THE FRONT END OF A PLUNGER(41) TO BE ASSEMBLED WITH A PISTON(42), A CUTTING NOTCH(45) AT THE FRONT PART OF A PLUNGER(41) IN ORDER TO BE EASILY BROKEN OFF, A CIRCULAR STOP PROMINENCE(50) AT THE FRONT PART OF A PLUNGER(41) REACHING TO THE REAR OF A PISTON(42), A REAR STOP PROJECTION(51) AT THE LONGITUDINAL CENTER OF A PLUNGER, AN EMPTY PART LONGITUDINALLY FROM A REAR STOP PROJECTION(51) TO A CUTTING NOTCH(45) IN THE CENTRAL INSIDE OF A PLUNGER.

A relevant difference between the first and the second embodiment is as follows:

According to the first embodiment, the plunger (41) has a cap (49), which serves to close the front hole of the cylinder (11) after injection, i.e. after retraction of the needle (21) into the cylinder (cp. Fig. 10 and 11).

According to the second emboldiment, a part of the plunger (11) itself serves (after breaking the plunger) to close the front hole of the cylinder (11) after injection, i.e. after retraction of the needle (21) into the cylinder. To close the front hole, the part of the plunger is inserted into the cylinder (cp. Fig. 16 and 18). Accordingly, the costs for the manufacturing of the cap (e.g. the cost for providing a mold) are saved.

Besides this difference, the general structure and functioning of the first and second embodiment are more or less the same.

In the above specification, the terms barrel and cylinder are used as synonyms. The needle inserting device or needle inserter (31) may as well be termed needle holder.

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CLAIMS

1. Safety syringe, having a cylinder (11), a syringe needle (21), a needle holder (31) associated to the cylinder (11) and adapted to hold the syringe needle (21), and a plunger (41) associated to the cylinder (11), wherein the plunger (41) comprises a piston (42) and serves to inject a filling of the cylinder (11) via the syringe needle (21), wherein the plunger (41) can be coupled with the needle holder (31) arranged in the region of a front hole (12) of the cylinder (11), to retract the needle holder (31) together with the syringe needle (21) into the cylinder (11) by pulling the plunger (41), and wherein the needle holder (21) is fixed or fixable in the region of the front hole (12) to the cylinder (11) by a groove-projection-arrangement (13, 34) having axially extending grooves (34) with wide tapered groove entrances for receiving a respective projection (13) so that the projections (13), after having passed the wide entrances and the axially extending grooves (34), can be rotated with respect to the axially extending grooves (34), to axially fix the needle holder (21) in the region of the front hole (12) against retraction into the cylinder (11).

2. Syringe according to claim 1, characterized in that the groove-projection-arrangement (13, 34) is arranged such that the needle holder (21), which is fixed in the region of the front hole (12) to the cylinder (11), can be released for retraction into the cylinder (11) by rotating the needle holder (21) with respect to the cylinder (11).

3. Syringe according to claim 2, characterized in that the coupling between the plunger (41) and the needle holder (21) is adapted, to effect a rotation of the needle holder (21) with respect to the cylinder

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(11) by rotating the plunger (41), which is coupled with the needle holder (21), with respect to the cylinder (11).

4. Syringe according to one of the preceeding claims, characterized in that the groove-projection-arrangement (13, 34) comprises grooves (34) located on the outer cylindrical surface (33) of the needle holder (31) and projections (13) located in the region of the front hole (12) on an inner surface of the cylinder (11) to be received in said grooves (34).

5. Syringe according to claim 4, characterized in that said grooves (34) have a first portion which substantially extends in axial direction, and a second portion which substantially extends in a circumferential direction, so that the grooves (34) are substantially L-shaped.

6. Safety syringe, having a cylinder (11), a syringe needle (21), a needle holder (31) associated to the cylinder (11) and adapted to hold the syringe needle (21), and a plunger (41) associated to the cylinder (11), wherein the plunger (41) comprises a piston (42) and serves to inject a filling of the cylinder (11) via the syringe needle (21), wherein the plunger (41) can be coupled with the needle holder (31) arranged in the region of a front hole (12) of the cylinder (11), to retract the needle holder (31) together with the syringe needle (21) into the cylinder (11) by pulling the plunger (41), and wherein the needle holder (21) is fixed or fixable in the region of the front hole (12) to the cylinder (11) by a groove-projection-arrangement (13, 34), said groove-projection-arrangement (13, 34) comprising grooves (34) located on an outer cylindrical surface (33) of the needle holder (31) and projections (13) located in the region of the front hole (12) on an inner surface of the cylinder (11) to be received in said grooves (34), said grooves (34) having a first portion which substantially extends in an axial direction, and a second portion which substantially extends in a circumferential

direction, so that the grooves are substantially L-shaped.

7. Syringe according to claim 6, characterized in that the groove-projection-arrangement (13, 34) is arranged such that the needle holder (21), which is fixed in the region of the front hole (12) to the cylinder (11), can be released for retraction into the cylinder (11) by rotating the needle holder (21) with respect to the cylinder (11).

8. Syringe according to claim 7, characterized in that the coupling between the plunger (41) and the needle holder (21) is adapted, to effect a rotation of the needle holder (21) with respect to the cylinder (11) by rotating the plunger (41), which is coupled with the needle holder (21), with respect to the cylinder (11).

9. Syringe according to one of the preceeding claims, characterized in that the plunger (41) has a predetermined breaking point, to allow that a re-use of the syringe can be inhibited by breaking the plunger (41).

10. Syringe according to one of the preceeding claims, characterized in that the plunger (41) carries a cap (49), which can be inserted in the front hole (12) of the cylinder (11) after retraction of the syringe needle (21) into the cylinder (11).

11. Syringe according to claim 9, characterized in that after breaking the plunger (41) a part of the plunger (41) can be inserted in the front hole (12) of the cylinder (11) after retraction of the syringe needle (21) into the cylinder (11).

12. Syringe according to one of the preceeding claims, characterized in that the plunger (41) and the needle holder (21) can be coupled by a snap-in connection (43, 43', 37).

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ABSTRACT

The invention provides a safety syringe, which has a cylinder (11), a syringe needle (21), a needle holder (31) associated to the cylinder and adapted to hold the syringe needle, and a plunger (41) associated to the cylinder (11), wherein the plunger (41) comprises a piston (42) and serves to inject a filling of the cylinder (11) via the syringe needle (21), and wherein the plunger (41) can be coupled with the needle holder (31) arranged in the region of a front hole (12) of the cylinder (11), to retract the needle holder (31) together with syringe needle (21) into the cylinder (11) by pulling the plunger (41).

(Fig. 1)

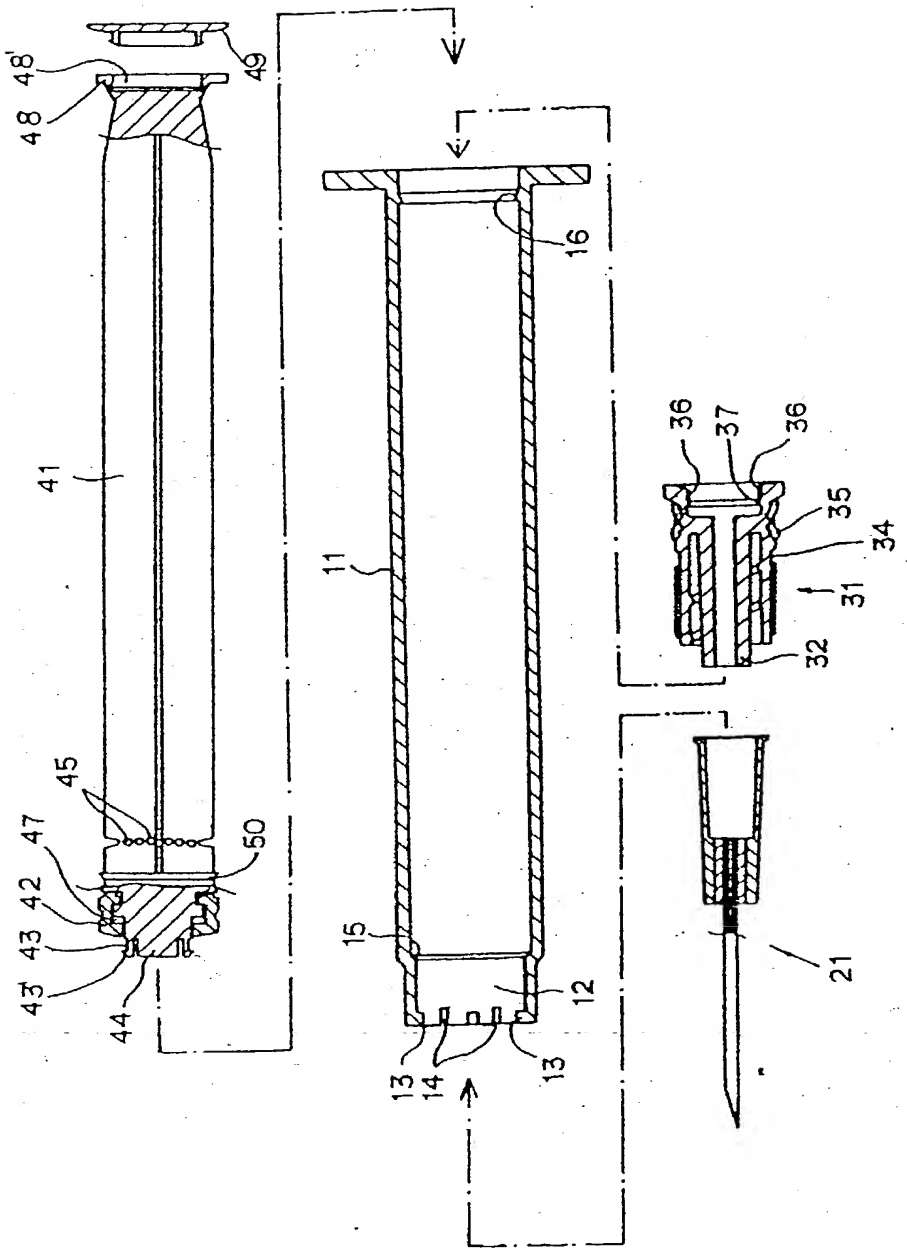
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Fig. 1

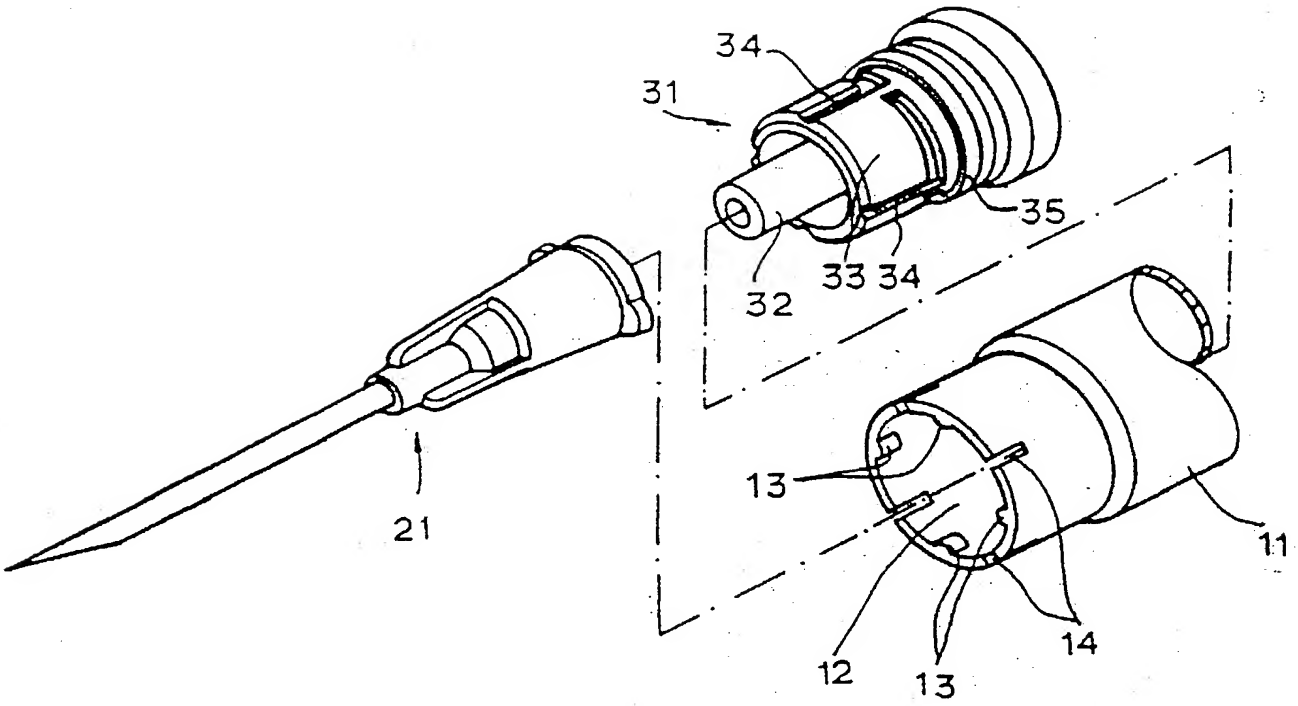


Fig. 2

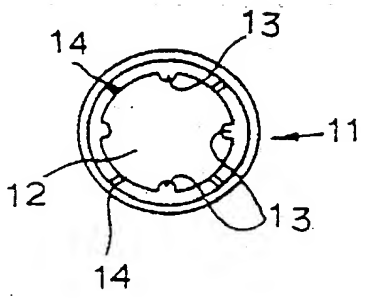
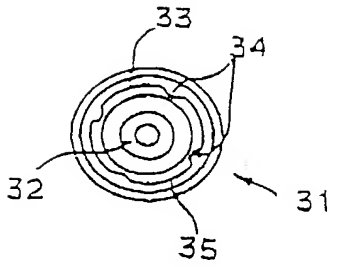


Fig. 3

Fig. 4



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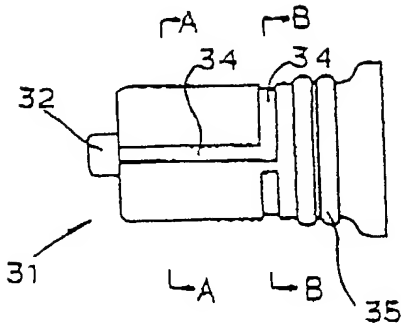
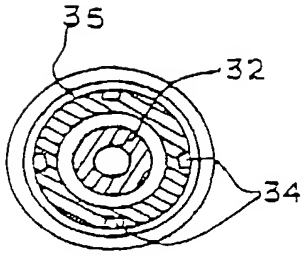
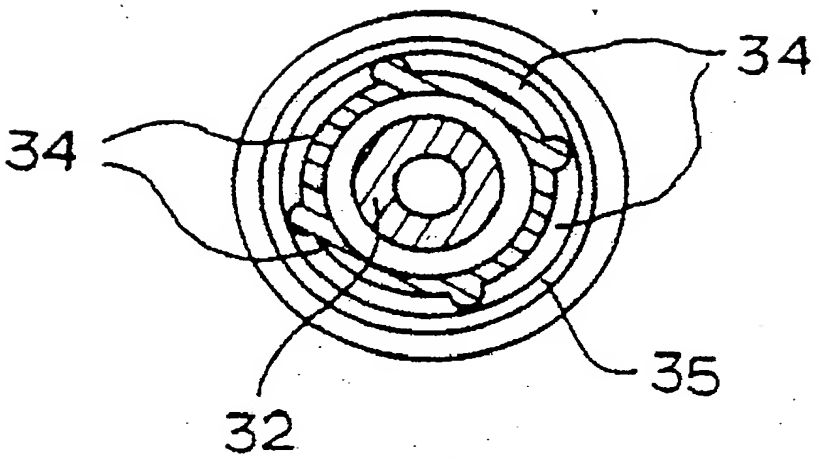


Fig. 6





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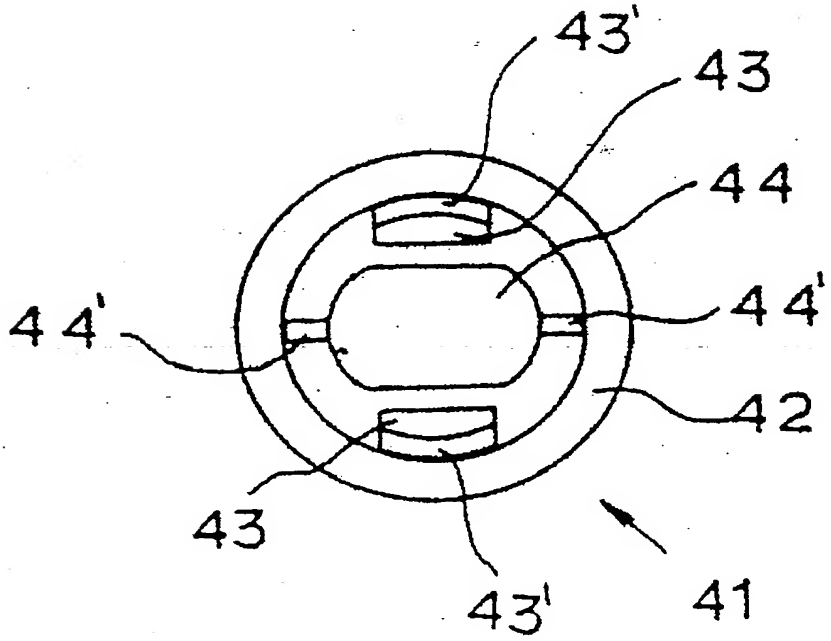

Fig. 8

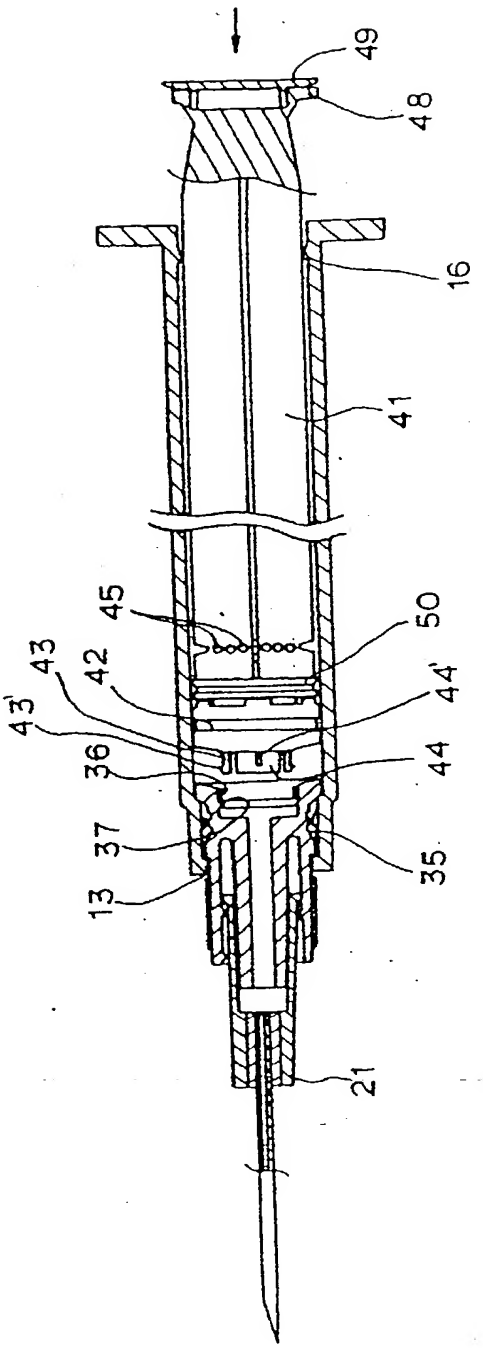
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Fig. 9

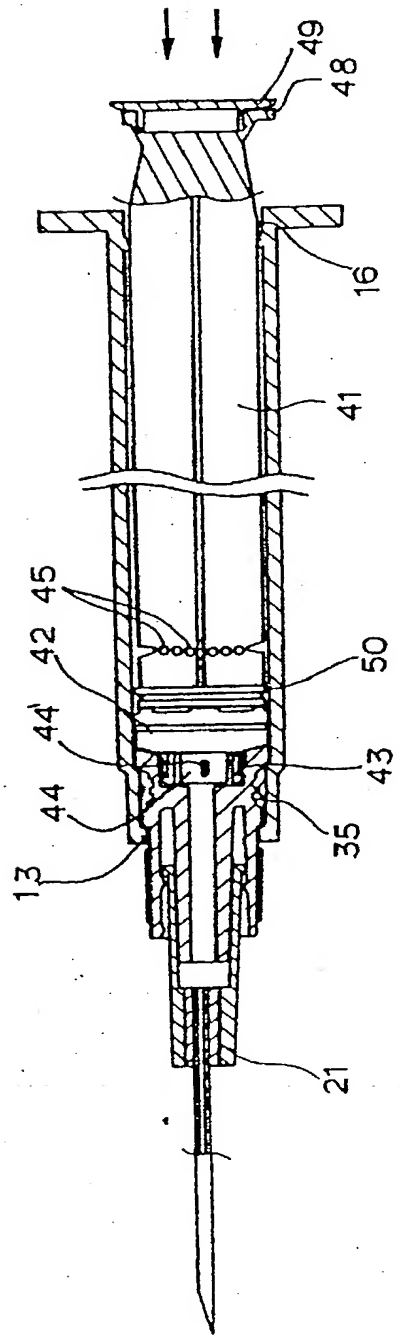
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Fig. 10

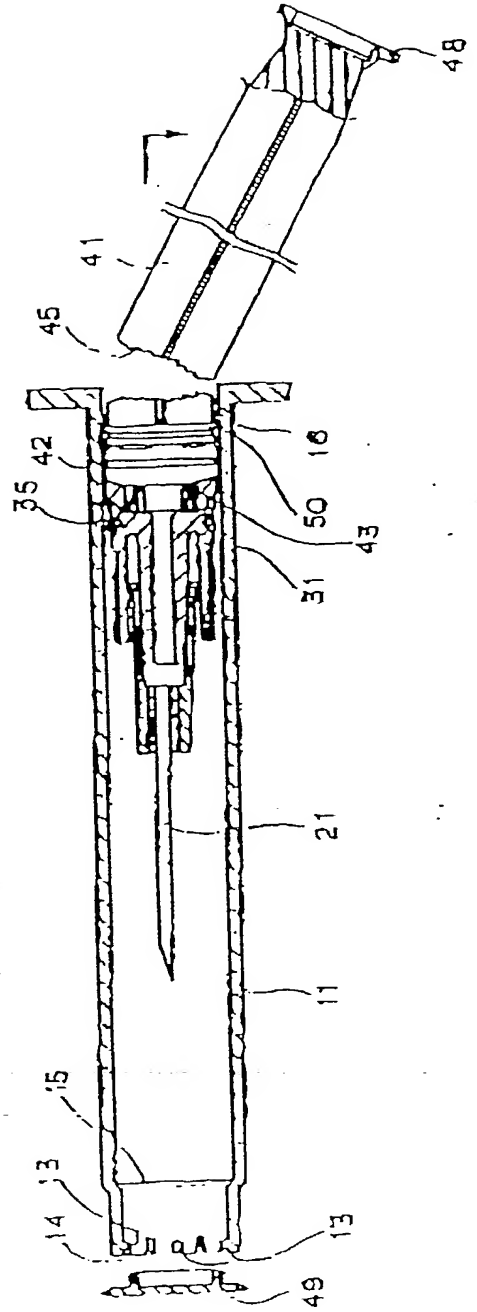

Fig. 11

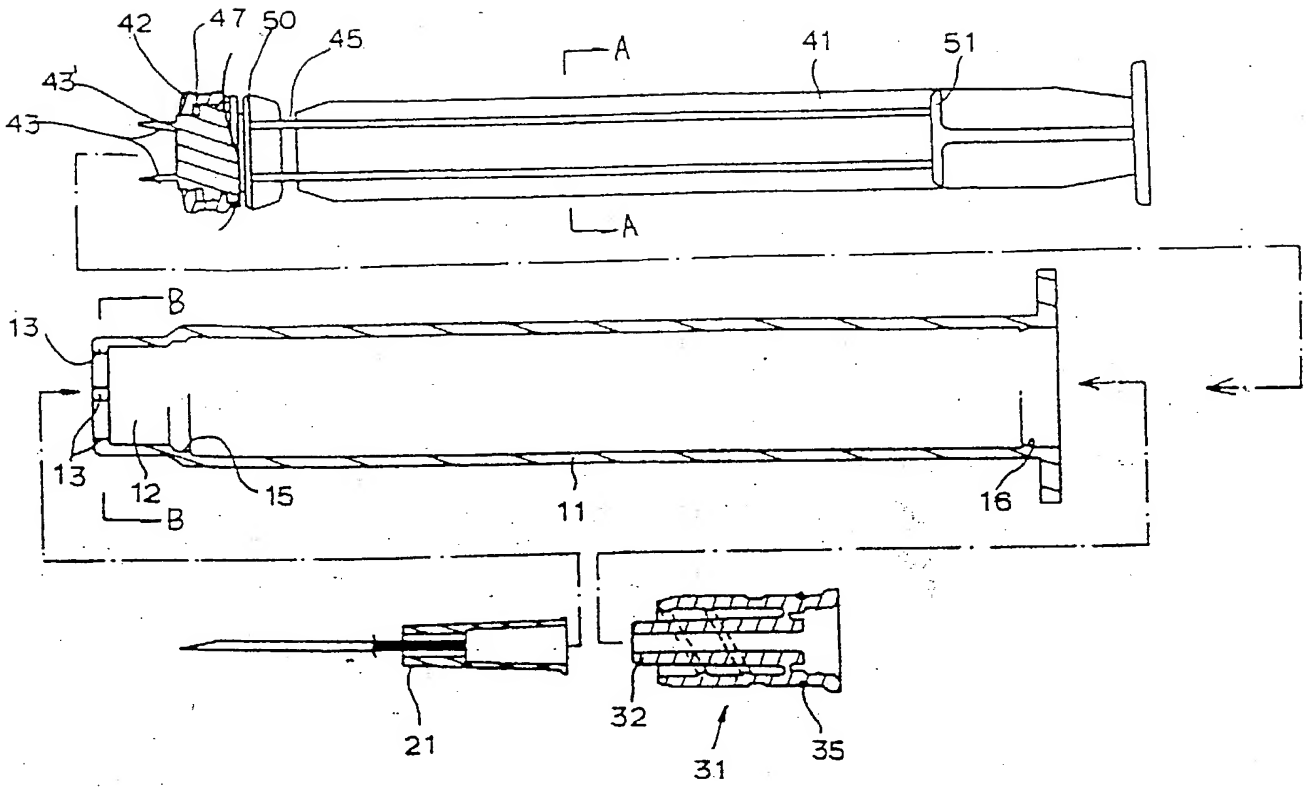
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Fig. 12

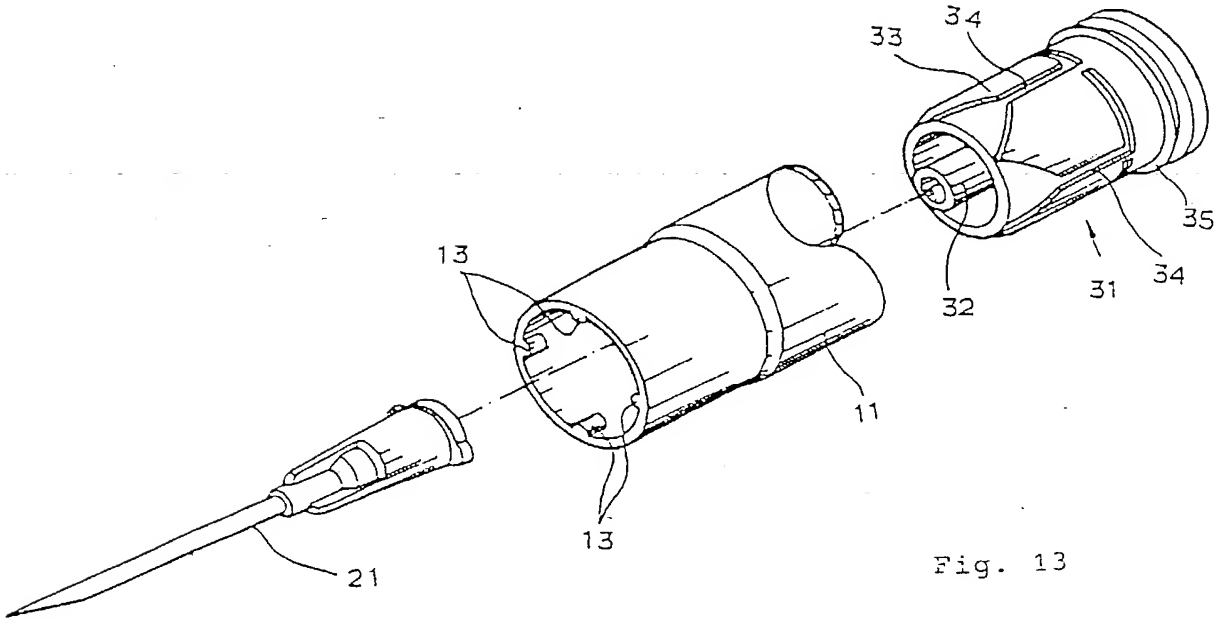
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Fig. 13

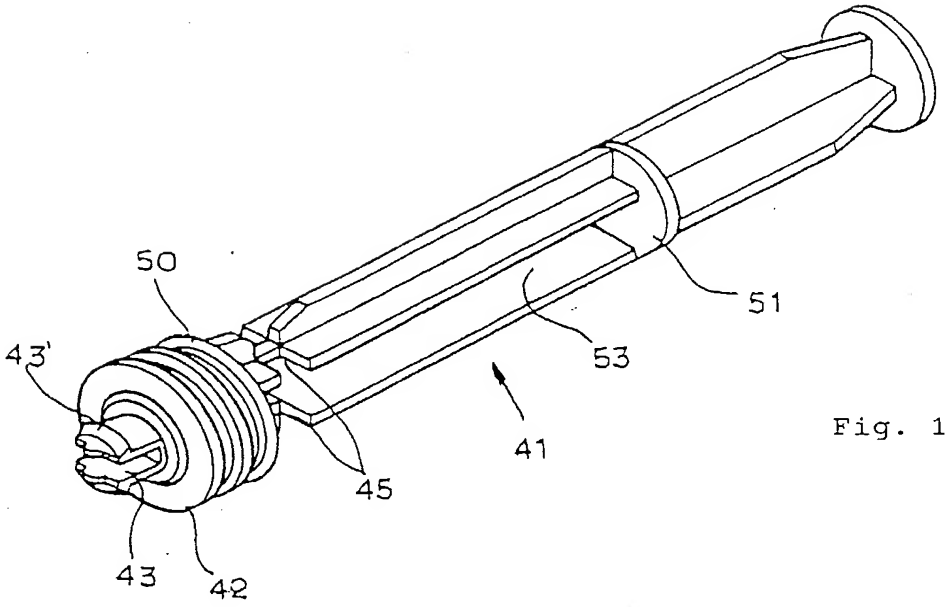


Fig. 14

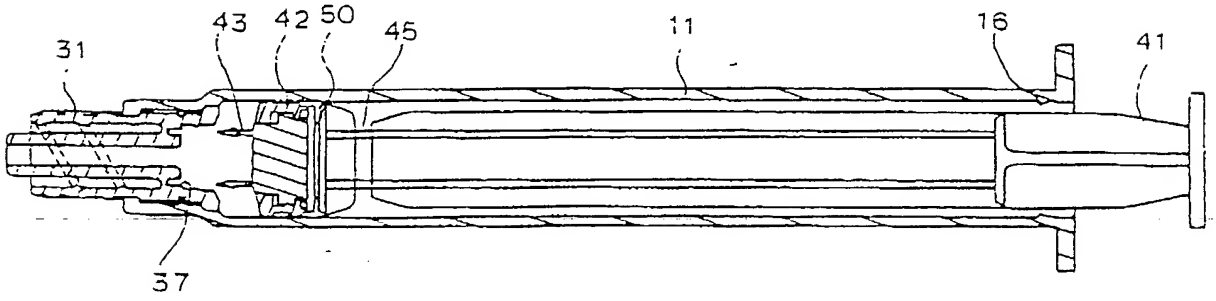


Fig. 15

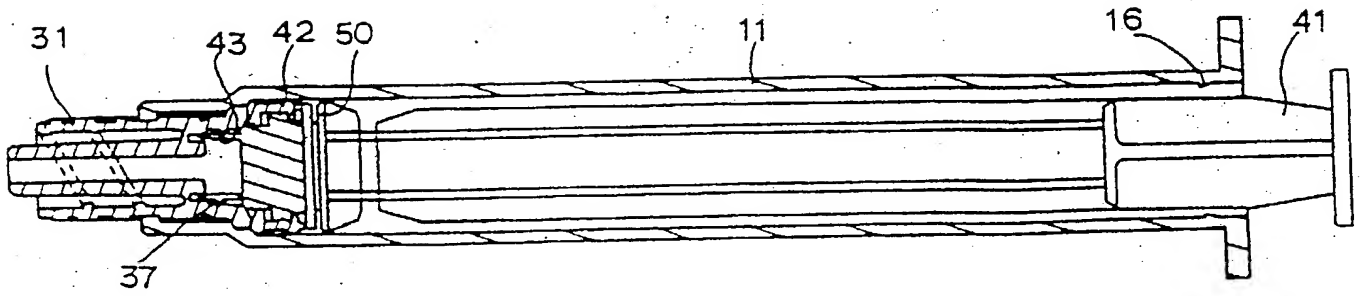


Fig. 16

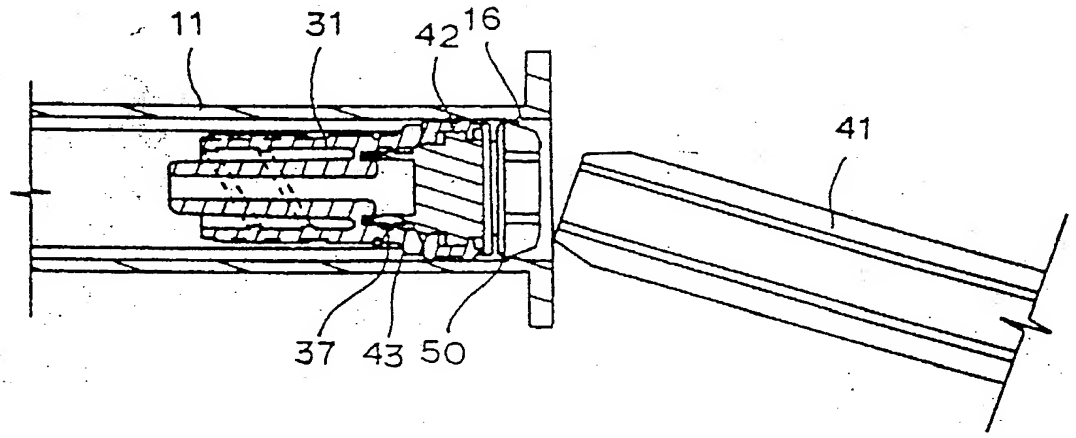


Fig. 17

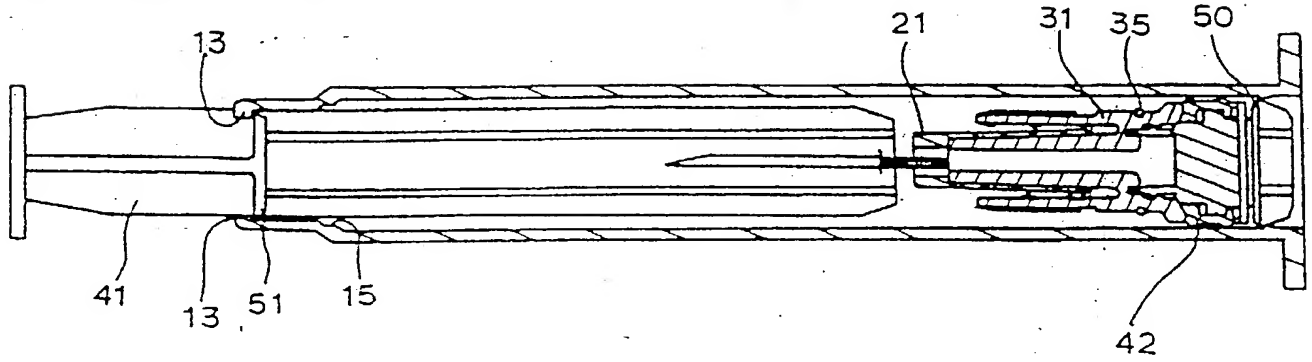


Fig. 18

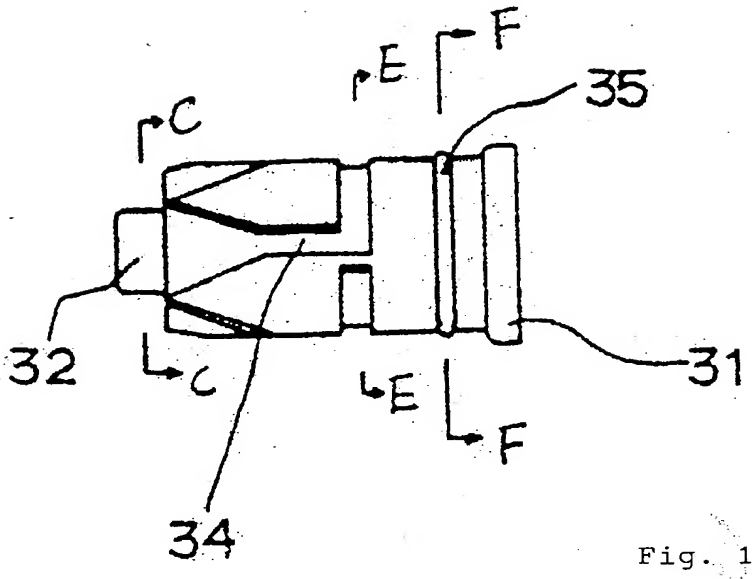


Fig. 19

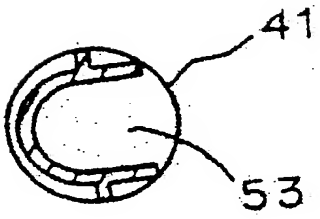


Fig. 20

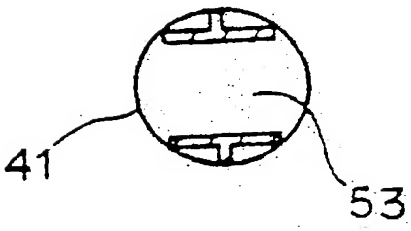


Fig. 21

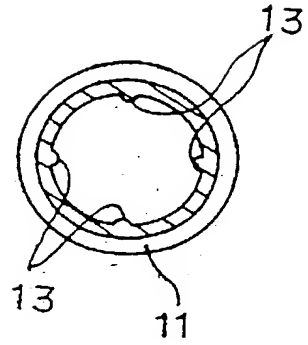
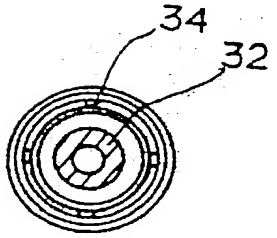


Fig. 22



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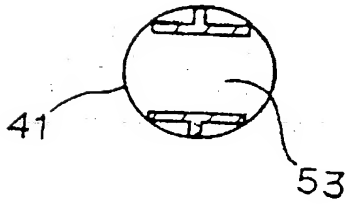
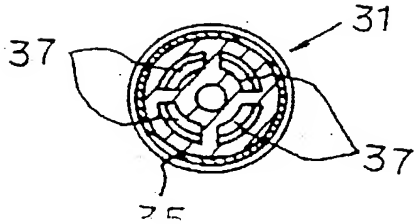


Fig. 24



COMBINED DECLARATION AND POWER OF ATTORNEY

(ORIGINAL, DESIGN, NATIONAL STAGE OF PCT, SUPPLEMENTAL, DIVISIONAL, CONTINUATION, OR C-I-P)

As a below named inventor, I hereby declare that:

TYPE OF DECLARATION

This declaration is for the national stage of a PCT application.

INVENTORSHIP IDENTIFICATION

My residence, post office address and citizenship are as stated below, next to my name. I believe that I am the original, first and sole inventor of the subject matter that is claimed, and for which a patent is sought on the invention entitled:

TITLE OF INVENTION

SAFETY SYRINGE

SPECIFICATION IDENTIFICATION

The specification was filed on January 25, 2002, as Serial No. 10/048,199.

ACKNOWLEDGMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information, which is material to patentability as defined in 37, Code of Federal Regulations, Section 1.56.

PRIORITY CLAIM (35 U.S.C. Section 119(a)-(d))

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

Such applications have been filed as follows.

PRIOR PCT APPLICATION(S) FILED WITHIN 12 MONTHS (6 MONTHS FOR DESIGN) PRIOR TO THIS APPLICATION AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. SECTION 119(a)-(d)

INDICATE IF PCT	APPLICATION NUMBER	DATE OF FILING DAY, MONTH, YEAR	PRIORITY CLAIMED UNDER 35 U.S.C. SECTION 119
PCT	PCT/EP00/07249	27 July 2000	Yes

POWER OF ATTORNEY

I hereby appoint the following practitioner(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

APPOINTED PRACTITIONER(S)	REGISTRATION NUMBER(S)
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Charles H. Thomas	25,710
David L. Hoffman	32,469
Daniel M. Cislo	32,973
Andrew S. Jordan	33,917
Robert J. Lauson	41,930
Kelly W. Cunningham	43,570
George L. Steele	46,154
Naomi Mann	46,431
Sarah A. Brown	47,455

I hereby appoint the practitioner(s) associated with the Customer Number provided below to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

AUTHORIZATION OF ATTORNEY(S) TO ACCEPT AND FOLLOW INSTRUCTIONS FROM REPRESENTATIVE

The undersigned to this declaration and power of practitioner hereby authorizes the U.S. practitioner(s) named herein to accept and follow instructions from:

Daniel M. Cislo, Esq.
Cislo & Thomas LLP
233 Wilshire Boulevard, Suite 900
Santa Monica, California 90401-1211

as to any actions to be taken in the Patent and Trademark Office regarding this application without direct communication between the U.S. practitioner(s) and the undersigned. In the event of a change in the person(s) from whom instructions may be taken, the U.S. practitioner(s) will be so notified by the undersigned.

SEND CORRESPONDENCE AND DIRECT TELEPHONE CALLS TO:

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www.cislo.com
Domain: dancislo@cislo.com

DECLARATION

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that there statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

SIGNATURE(S)

Inventor Young Chul Bang / President of Medexel Medical Manufacturing Co., Ltd

Inventor's signature _____

Date 27. AUG. 2002 Country of Citizenship Korea

Residence Kyunggi-Do, Korea

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Ansung-Si, Kyunggi-Do, KOREA KRX